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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/779,812	02/18/2004	Mikhail Vasilievich Shovgenyuk		6822

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M.V. Shovgenyuk
14/30, Kavaleridze Str
Lviv, 79066
UKRAINE

EXAMINER

AZARIAN, SEYED H

ART UNIT PAPER NUMBER

2624

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/14/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/779,812	Applicant(s) SHOYGENYUK ET AL.	
	Examiner Seyed Azarian	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. Claims 1-7 and 9-22, are rejected under 35 U.S.C. 102(e) as being anticipated by Wang (U.S. patent 6,731,409).

Regarding claim 1, Wang discloses a graphic protection element of banknotes, securities, documents which consists of (column 1, lines 9-11, applying a color watermark to a digitally reproducible color image to enable the verification and authenticity);

the printed encoded image containing the encoded information about the original image and which is generated by global replacement of each level of the multilevel original image with the matrix of cells which has an ordered aperiodic structure of high resolution (column 3, lines 45-61, the contrast of the colors of the watermark is enhanced to improve the watermark's detectability reducing the detectability of the watermark in base image, also column 5, lines 17-23, the halftone images are generated from constant gray-scale inputs by a screen matrix and Fig. 11, column 11, lines 13-21);

the printed key of the encoded image which is intended for its decoding and is formed, at least, from one matrix of cells of this ordered aperiodic structure (column 5, lines 25-40,

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dithering (aperiodic structure) is defined as a threshold mask generating halftone images which satisfy the above criterion for all gray levels);

inversely printed on the other side of the protected object and precisely matched with the encoded image therewith in reflected light encoding matrices of cells on both sides of the protected object are visually similar and are perceived as neutral gray or color homogeneous background, and in transmitted light the visible image of the graphic element, which color may differ from visible colors of the encoded image and the key, is observed (column 4, lines 4-18, as result the two halftone patterns are laid over each to become properly aligned or otherwise appropriately aligned, the watermark patterns of highly contrasting colors become markedly visible, also column 5, lines 16-23, halftone images are generated from constant gray-scale inputs by a screen matrix with n elements and Fig. 11, column 11, lines 13-27, refer to enhancement or high resolution);

Regarding claim 2, Wang discloses a graphic element according to claim 1 in which the printed encoded image and the printed key of the encoded image are 2-dimensional matrices of binary cells (column 7, lines 53-64, a two-dimensional auto correlation of the halftone image, also column 9, lines 43-57, screen matrices supplied to each comparator).

Regarding claim 3, Wang discloses a graphic element according to claim 1 in which printed encoded image is superimposed over the printed key of the encoded image to form the visible image of a graphic element (column 12, lines 40-47, to produce the same effect as superimposing the halftone screens).

Regarding claim 4, Wang discloses a graphic element according to claim 1 in which the encoded image includes additional encoded images, which are decoded by a separately printed

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additional key (see claim 1, also column 3, line 55 through column 4, line 2, refer to additional stochastic halftone screen).

Regarding claim 5, Wang discloses a graphic element according to claim 1 in which the same key is used for decoding different encoded images of the graphic element (column 3, line 55 through column 4, line 2, color separation).

Regarding claim 6, Wang discloses a method of manufacturing of a graphic element for protection of banknotes, securities, documents, the method consisting of encoding, i.e. encoded image and its key image are formed on the basis of original image using special software, which converts an original image into multilevel graphic image whose each level is globally replaced with corresponding matrix of cells of the ordered aperiodic structure (see claim 1, also column 9, lines 7-24, software system and microprocessor).

Regarding claim 7, Wang discloses a method according to claim 6 in which the encoded image and its key may have different dimensions (column 7, lines 43-65, two images).

Regarding claim 9, Wang discloses a method according to claim 6 in which two-level graphic encoded image is formed using replacement of both levels of the original graphic image with matrix of cells of complementary ordered aperiodic structures of 50% area coverage (column 5, lines 17-56, an arbitrary pair of pixels from the dithering (aperiodic structure), screen).

Regarding claim 10, Wang discloses a method according to claim 6 in which area coverage of a matrix of cells of the two-level encoded image is reduced by withdrawal of the certain part of dark cells to form enlightened encoded image (Fig. 2, column 9, lines 43-58).

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Regarding claim 11, Wang discloses a method according to claim 6 in which the three-level graphic encoded image is formed by replacement of two levels of original graphic image with matrix of complementary cells, and the third level of the original graphic image is replaced with matrix of cells of partially complementary ordered aperiodic structure (Fig. 12, column 11, lines 23-40, two enlarged stochastic halftone screens containing two sub cells in each halftone screen).

Regarding claim 12, Wang discloses a method according to claim 6 further including the step of printing, i.e. encoded image is printed on object of protection, and the key of the encoded image is printed inversely on the other side of the protected object, precisely matching the encoded image (column 4, lines 4-18, as result the two halftone patterns are laid over each to become properly aligned or otherwise appropriately aligned, the watermark patterns of highly contrasting colors become markedly visible, also column 5, lines 16-23, halftone images are generated from constant gray-scale inputs by a screen matrix with n elements and Fig. 11, column 11, lines 13-27, refer to enhancement or high resolution).

Regarding claim 13, Wang discloses a method according to claim 12 in which the encoded image is printed in color inks on the protected object with certain angular orientation (column 12, lines 7-18, printed image in color).

Regarding claim 14, Wang discloses a method according to claim 12 in which the encoded image and its key are printed with resolution which is greater and not multiple to resolution of copiers (column 11, lines 13-21, enhanced color contrast).

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Regarding claim 15, Wang discloses a method according to claim 12 in which the encoded image and its key are printed in special color printing inks of two complementary colors (column 8, lines 40-55, multiple color separation).

Regarding claim 17, Wang discloses a method according to claim 12 in which the encoded image is printed in a color printing ink reflecting light in one of three ranges of visible spectrum, on color background which reflects light in two other ranges of visible spectrum and the key is printed in color or neutral gray ink composed of synthesis colors (column 13, lines 5-18, multi-color watermark and visibility).

Regarding claim 19, Wang discloses a method according to claim 12 in which the encoded image and its key are printed on background of the visible unilateral combined graphic image to form additional elements of the visible image, special marks or symbols for additional protection (Fig. 12, column 11, lines 23-40, two enlarged stochastic halftone screens containing two sub cells in each halftone screen, each sub cell containing a digitized X logo).

Regarding claim 21, Wang discloses a method according to claim 12 in which the encoded image and its key are printed on a paper with a light watermark which is additionally processed by an agent to increase of its transparency (column 8, line 56 through column 9, line 5, printed document).

With regard to claims 16, 18, 20 and 22, the arguments analogous to those presented above for claims 1, 4, 15, 17 and 19.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 8, is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang (U.S. patent 6,731,409) in view of Ho et al (U.S. patent 6,983,057).

However regarding claim 8, Wang discloses (column 5, lines 25-40, dithering (aperiodic structure) is defined as a threshold mask generating halftone images which satisfy the above criterion for all gray levels), but does not explicitly state it's corresponding "aperiodic structure are built using the Kronecker product method from basis orthogonal Hadamard matrices). On the other hand Hu in the same field of analysis of fabric surface teaches (see abstract, also column 4, lines 22-34 usage of DCT transform as the embedding domain. However other orthogonal transforms such as Walsh Hadamard can be used).

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Wang invention according to the teaching of Hu because it is techniques, which easily can be implemented in producing graphic element for protecting banknotes or securities documents.

Other prior art cited

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

(U.S. patent 5,790,703) to wang is cited for digital watermarking using conjugate halftone screens.

(U.S. patent 6,871,789) to Hilton et al is cited for document printed with graphical symbols which encode information.

(U.S. patent 5,734,752) to Knox is cited for digital watermarking using stochastic screen patterns.

(U.S. patent 6,614,914) Rhoads et al is cited for watermark embedder and reader.

Contact Information

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Seyed Azarian whose telephone number is (571) 272-7443. The examiner can normally be reached on Monday through Thursday from 6:00 a.m. to 7:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella, can be reached at (571) 272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application information Retrieval (PAIR) system. Status information for published application may be obtained from either Private PAIR or Public PAIR.

Status information about the PAIR system, see [http:// pair-direct.uspto.gov](http://pair-direct.uspto.gov). Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Seyed Azarian
Patent Examiner
Group Art Unit 2624
March 7, 2007

